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## STRIDULATORY MECHANISMS IN AQUATIC AND SEMIAQUATIC HETEROPTERA

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A number of new discoveries of putative stridulatory mechanisms in aquatic and semiaquatic Heteroptera are reported here, and previously recognized structures

briefly reviewed. This is a preview of a more comprehensive article (in preparation) giving an overview of communication in aquatic Heteroptera that will include illustrations of the various mechanisms. Publication of these data is needed for a book on the natural history of Heteroptera now in preparation by Schuh, Slater and Stys. Only the suborders Gerromorpha and Nepomorpha are included, as the stridulatory mechanisms of the Leptopodomorpha have been adequately reviewed by Polhemus (1985) and Pericart and Polhemus (1990). A recent review of sound production in aquatic insects by Aiken (1985) dealt with the truly aquatic bugs, but the list below adds two families and nine genera to the taxa of the suborder Nepomorpha possessing stridulatory structures, plus several heretofore unrecognized mechanisms.

Stridulatory mechanisms have two parts, a stationary part characterized as the strigil (alternatively stridulitrum, scraper), and a movable part, the plectrum (alternatively pars stridens, file). Occurrences are listed below by the taxa possessing one or more stridulatory mechanisms, followed by the type of mechanism (strigil first, plectrum second). If the knowledge is published or in press, the citation is given; all others are reported here for the first time, and marked with an asterisk (\*).

Sound production has been reported for the family Belostomatidae (Aiken, 1985; Smith, 1982) however the structures have not been found, so this family is not treated below. Sound production in *Nepa cinerea* L. (Nepidae) was reported by Swinton (1877), who described a supposed pronotum-mesonotum mechanism which was discounted by Handlirsch (1900), thus no plausible mechanism is yet known. While stridulation has been presumed in the corixid subfamilies Cymatiinae and Diaprepocorinae (Aiken, 1985), it has only been demonstrated in the subfamilies Corixinae and Micronectinae (Jansson, 1989), thus only the latter two are included here.

#### GERROMORPHA

**Gerridae:** *Metrobates* Uhler: about half of the species; males and females. Mechanism: fine ridges on mesoacetabulae; sharp ridge on posterior trochanter (J. and D. Polhemus, 1993).

**Veliidae:** *Angilovelvia* Andersen: *A.  $\gamma$ -alba* (Paiva) from Asia; males and females. Mechanism: fine ridges on connexival margin; patch of many sharp pegs on dorsum of hind femur (Andersen, 1981).

**Veliidae:** *Paravelia* Breddin: *P. stenoptera* J. and D. Polhemus from Surinam, one undescribed species\* from Venezuela; males and females. Mechanism: row of pegs on sides of abdominal sterna III, IV; patch of sharp pegs on hind trochanter (*P. stenoptera* reported by J. and D. Polhemus, 1984).

**Veliidae:** *Rhagovelvia* Mayr: *R. lugubris* Lundblad from Java; males and females. Mechanism: patch of sharp pegs on sides of abdominal sternum III; ridges on hind trochanter (J. and D. Polhemus, 1988).

**Veliidae:** *Stridulivelia* Hungerford: all species of the subgenus *Stridulivelia*; males and females. Mechanism: ridges or denticles on connexival margin; patch of many spinulae or sharp pegs on dorsum of hind femur (Hungerford, 1929).

#### NEPOMORPHA

**Corixidae:** Many genera in the subfamily Corixinae; males and females. Mechanism: sharp ridges on head; roughened patch on fore femur (review by Aiken, 1985).

**Corixidae:** Many (probably all) species in the subfamily Micronectinae; males only. Mechanism: sharp ridges on abdominal segment 8 (genital capsule; left lobe in *Micronecta* and *Synaptonecta*, right lobe in *Tenagobia*); basal ridges on right paramere (Jansson, 1989; Jansson and Meyer-Rochow, 1990).

**Gelastocoridae:** *Nerthra* Say: males of all species worldwide. Mechanism: sclerotized ridges on a dorsally oriented portion of abdominal segment 9 (genital capsule); ridge on proctiger (Polhemus and Lindskog, 1994).

**Helotrephidae:** Helotrepini, all species of the genera *Esakiella* China, *Helotrepes* Stål: *Hydrotrepes* China (with the possible exception of African species of *Esakiella* China; *Pseudohydrotrepes* Poisson not studied); males and females. Mechanism: serrations on costal margin of hemelytra; distal ridge on hind femur (Polhemus, 1990).

**Helotrephidae:** *Helotrepes* Stål: *H. formosanus* Esaki and Miyamoto, *H. semiglobosus* Stål; males and females. Mechanism: rastrate patch on mesepisternum; finger-like process on prosternum (review in Polhemus, 1990).

**Helotrephidae:** *Limnotrepes* Esaki and China: *L. kumaonis* Polhemus from India; males and females. Mechanism: rastrate patch on mesepisternum; finger-like process on prosternum (Polhemus, 1990).

**Naucoridae:** *Limnocoris* Stål\*: all species, all from New World; males and females. Mechanism: sclerotized ridges on lateral margin of at least abdominal sterna II, III; distal ridge on hind femur.

**Naucoridae:** *Ilyocoris* Stål: *I. cimicoides* (L.); Males. Mechanism: sclerotized ridges on abdominal tergite II; sclerotized region on hind margin of abdominal tergite I (Hofeneder, 1937). [Not confirmed as stridulatory, although sound production has been reported, first by Frisch (1727).]

**Nepidae:** *Ranatra* F.: all but four New World species. Same mechanism in adults and immatures (Kirkaldy, 1906), possibly the only such occurrence in aquatic insects (Sites and Polhemus, 1994). Mechanism: sclerotized ridges on lateral margin of anterior coxal cavity; ridges on anterior coxae (Torre Bueno, 1905).

**Notonectidae:** *Buenoa* Kirkaldy: All species; males only. Mechanism 1: rostral prong; anterior tibial comb. Mechanism 2 (absent in a few species): anterior femoral file; anterior coxal peg (both mechanisms discussed by Wilcox, 1969, 1975).

**Notonectidae:** *Anisops* Spinola: All species except *B. aglaia* Hutchinson; males only. Mechanism: rostral prong; anterior tibial comb (review by Aiken, 1985).

**Notonectidae:** *Anisops* Spinola: *A. millotti* Poisson group\* (*millotti* plus two undescribed spp.) from Madagascar; males and females, sexually dimorphic. Mechanism 1 (males): transverse carinae beneath abdominal connexiva; basal ridge on hind femur (connexival carinae described for *millotti* by Lansbury, 1966; only tentatively suggested as stridulatory). Mechanism 2 (females): denticles on costal margin of hemelytra; basal ridge on hind femur. Mechanism 3 (females): Sclerotized raised ridge on outer corium of hemelytra; short blunt spines near base of hind femur. (These in addition to the usual mechanism found in *Anisops*.)

**Notonectidae:** *Anisops* Spinola: *A. hancocki* Hutchinson\*, *A. psyche* Hutchinson\*, both from Africa; males only. Mechanism: pegs beneath abdominal connexiva (connexival pegs of both species mentioned by Lansbury, 1966, but not suggested as stridulatory); basal ridge on hind femur (in addition to the usual mechanism found in *Anisops*).

**Notonectidae:** *Enithares* Spinola\*: *E. biimpressus* (Uhler), *E. stridulata* Brooks, *E. tibialis* Liu and Zheng, all from Asia, *E. nigra* Lansbury from New Guinea, an undescribed species from Sumbawa; males and females. Mechanism: ridges beneath abdominal connexiva (illustrated by Lansbury, 1968 for *nigra*, but not suggested as stridulatory); basal posterolateral ridge on hind femur.

**Notonectidae:** *Martarega* White\*: One undescribed species from Venezuela; males and females. Mechanism: denticles on costal margin of hemelytra; basal ridge on hind femur.

**Pleidae:** *Plea* Leach: *P. minutissima* Leach; males and females. Mechanism: rastrate patch on mesepisternum; finger-like process on prosternum (Wefelscheid, 1912).—*John T. Polhemus, University of Colorado Museum, 3115 South York, Englewood, Colorado 80110.*

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**A REPLACEMENT NAME FOR  
MYRMECOMIRIS POLHEMUS AND RAZAFIMAHATRATRA  
(HETEROPTERA: MIRIDAE)**

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Polhemus and Razafimahatratra (1990) described the new mymecomorphic mirid genus *Myrmecomiris* from southwestern Madagascar. Due to a lapsus these authors overlooked the fact that *Myrmecomiris* had already been proposed as a genus group name by Maldonado (1976) for a mirid in the tribe Herdoniini from Panama, and thus created a primary homonym. To rectify this situation, I propose the replacement genus name *Vitsikamiris*, n. gen. (from the Malagasy word “vitsika” for ant; gender masculine). The type-species of this monotypic genus, *Myrmecomiris madecassa*, thus becomes *Vitsikamiris madecassa* (Polhemus and Razafimahatratra), n. comb.—*Dan A. Polhemus, Dept. of Life Sciences, Bishop Museum, P.O. Box 19000-A, Honolulu, Hawaii 96817.*